

Final edition June 2022

To find out more about  
The Environmental Futures  
& Big Data Impact Lab visit  
[plymouth.ac.uk/research/impact-lab](http://plymouth.ac.uk/research/impact-lab)





# How we support Devon SMEs



The Environmental Futures and Big Data Impact Lab project gives Devon-based SMEs the opportunity to work collaboratively with our scientists and technologists to develop new products, services or processes with a focus on big data and safeguarding the environment.

### What is Big Data?

Big Data is viewed as an 'enabler' for all of the projects we deliver, but it may also be a key component for some projects. The seven partners in Impact Lab have significant and growing volumes of data that we help SMEs utilise.

We use the term Big Data to encompass not only the data itself but also the skills, knowledge and capability to manipulate and exploit the data. It also includes a variety of data science and digital technology approaches and tools including AI, machine vision, optimisation, the High Performance Computer and communication and visualisation techniques to deliver products and services.

### What are environmental futures?

Environmental Futures are defined as the problems and opportunities arising from human activity or global trends, where digital technology, big data, other disciplines and cross functional and cross institutional working can provide a viable solution.

### Environmental Futures encompasses environmental sciences and covers

- Atmospheric
- Terrestrial
- Freshwater and marine
- Pollution control and mitigation
- Meteorological sciences
- Climate change
- Ecology and environmental monitoring
- Impacts on ecosystems goods and services.

Each company we work with receives a bespoke package to suit their needs. Our services are free of charge, although our grants require a match funding contribution from the business. The range of support we offer includes:

### Specialist technical support

The heart of what the Impact Lab offers is resource for collaborative projects to help businesses solve a key technical challenge in the development of a new product, service or process.

### Academic expertise

To deliver a project, we can also call on the support of a wide range of academic specialists from within any of the seven Impact Lab partners. These academics can provide specific skills and subject-matter expertise where needed.

### Grants for products and services

If additional products or services are required to make a project successful, we provide support with applying for a grant to reimburse 60 per cent of the costs. Grant applications can range from £1,000 to £50,000 depending on demand, of which the SME must be able to provide the remaining 40 per cent.

### Collaborative working space

The Impact Lab offers desk space in one of our dedicated project offices. We have seats available at our main building on the Exeter Science Park; at the University of Plymouth

with the Sustainable Earth Institute and the Immersive Vision Theatre; and on site at Rothamsted's North Wyke research station near Okehampton.

### Workshops and networking events

We host events and workshops where innovators can collaborate, make new connections and receive mentorship and guidance. Bringing together minds and expertise to help participants work on solving their most pressing environmental and big data issues.

### Advice and referrals

In addition to services offered directly by the Impact Lab, we work closely with an extensive network of organisations and entrepreneurs who can address all areas of business support needs and provide guidance and mentorship.

### Eligibility

The Impact Lab works with Devon based SMEs, meaning fewer than 250 employees and with a registered office in Devon.

The following case studies demonstrate the range of SMEs and diversity of projects that the University of Plymouth Impact Lab has supported.

## Pulsiv

Pulsiv are behind a unique solar micro-inverter technology that significantly increases the efficiency of how power is generated, converted and supplied. They wanted to attract investment towards commercialisation and further developing the technology to be its most efficient version possible.

Impact Lab supported Pulsiv by creating an animation to communicate the potential of the technology and its environmental benefits. This included a data visualisation piece illustrating comparative figures with industry competition to demonstrate its competitive advantage. The team undertook storyboarding and narration writing, prototyping, asset creation, animation, audio recording and editing. The artwork and animation style was created to fit the existing branding deployed on the Pulsiv website. The animation was shared with the engineering firm Bosch, helping secure collaborative support for Pulsiv and opportunities for future innovation within renewable energy and efficient power usage.



Impact Lab was engaged to investigate the company's data to enable comparative volume forecasts.

## Harrier LLC

Harrier LLC have been printing photos at their site in Newton Abbot for over 40 years. In that time technology has seen a transition from 110mm film to 35mm film and to the mass market digitised photos of today. The business has expanded rapidly in the last three years and diversified into the wider high volume personalised photographic product and short run digital printing markets.

The Impact Lab was engaged to investigate the company's data to enable comparative volume forecasts. Until recently, they had used simple year-on-year, times-series based comparative volume forecasts to create their daily forecasts. Impact Lab investigated other external sources that significantly influence sales and used this information to create accurate and meaningful predictive models for Harrier LLC to work with.

## Software Solved

Software Solved is a data and software specialist operating across a variety of sectors including insurance, retail and logistics. Working with clients, they help unlock and harness data to build unique solutions to solve business problems and create a competitive advantage.

In early 2019, Software Solved embarked on a machine learning project with Innovate UK that is focused on Insurance risk prediction and is being delivered in association with the University of Plymouth. Open source data sets are an important part of this and, working with Impact Lab and project partner Exeter City Futures, valuable data sources were identified covering a range of situations such as natural disasters, crime data and location-specific information which has helped accelerate the project.



## Plymouth Boat Trips

Joining forces with several local partners, Plymouth Boat Trips is part of the e-Voyager project, developing the UK's first seagoing electric passenger vessel. Powered by repurposed Nissan Leaf batteries, the e-Voyager promises commercial and environmental benefits.

Impact Lab is working with Plymouth Boat Trips to provide a range of support, including support with application for grant funds that will be used for the electric propulsion and battery systems.

Specialist technical support and research expertise will help source the optimal system and with putting sensors in place to record data about air, water and noise pollution from the vessel.

Impact Lab will use the data to create a data visualisation piece to share with the project's stakeholders, demonstrating the environmental benefits for Plymouth Sound. When in operation, the new boat will join Plymouth Boat Trips fleet and service ferry routes, including the Cremyll Ferry.



## Willand Group

Willand group is a systems integrator developing advanced, environmentally sustainable, livestock housing systems for the agricultural sector.

The Group accessed Impact Lab support to model the system they are bringing to the market. The work included creating 3D imagery of several aspects, followed by a visualisation piece to explain the scientific benefits of the infrastructures and how it can be applied to different livestock and crops.



## Fieldwork Robotics

Fieldwork Robotics develop modular, multi-crop, soft and adaptive robots for use in non-controllable environments such as agriculture fields, alongside people working on non-repetitive tasks such as picking fruit. This patent-pending technology replicates human movements using soft-arms and grippers with a precise and delicate touch. The technology has been designed to identify, pick and handle delicate fruit with high specifications, such as temperature and appearance, to meet the demanding requirements of major buyers, including supermarkets. There is currently no similar technology on the market.

Fieldwork Robotics have worked with the skills and expertise of the Impact Lab visualisation team to create an animation which can help explain the complexities of the robotics, how their service works and the benefits of using them. Helping both the public, businesses and investors understand this technology will help some of the issues facing the agriculture industry. Support was also given towards the business' logo design and branding.

We helped enable both the client and their customers to identify areas of change prior to production.

## Oakmount Control Systems Ltd

Oakmount Control Systems Ltd are a team of experienced Automation, Electrical and Mechanical Engineers with sites in Plymouth and Yeovil, offering solutions for any automation or process control requirement. Involved at every stage of a project from conceptual discussions and design, precision tooling, fabrication, assembly, installation, testing, commissioning, after sales support and servicing.

Impact Lab enabled the client to access the skills and expertise of University of Plymouth with regard to visualisation of their production and development stages. Thus enabling both the client and their customers to engage with the machinery, see it as a working model and identify areas of change prior to the commencement of production.

## Kaleider

Kaleider is a production studio that produces artwork and supports others to create and deliver programmes that invite audiences to think about the world.

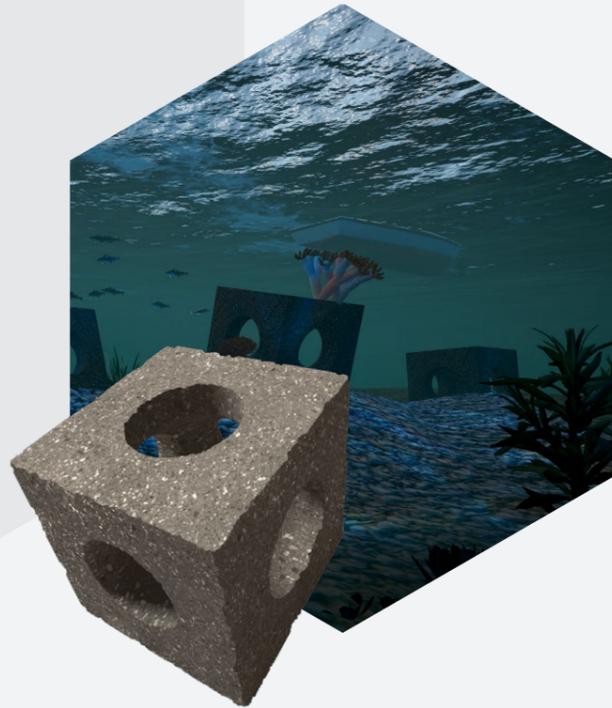
Impact lab delivered an introductory Fulldome workshop using a 3-meter inflatable dome with fisheye projection within the Kaleider studio space. The day included demonstrations, tutorials and discussion focused on the use of 360 degree cameras, animation workflows and game engine software to construct immersive environments to engage with audiences.



## Arc Marine

ARC Marine Ltd are creating eco-friendly building materials for use in our oceans. Their current focus is on Reef Cubes, which can be used for a range of engineering and scientific purposes, including turbine support, scour protection and pipeline covering, while providing a supportive habitat for ocean life and reef regeneration.

Impact Lab support was aimed towards creation of a virtual oceanic cross section to demonstrate the sustainable block product. The speculative coastal and deep-sea regions allow for both animated and interactive engagement with the different scenarios and operations Arc Marine are developing. While demonstrating and explaining the Reef Cube technology the animations will be used at international conferences and online for both public and business engagement.



## Treeconomics

Treeconomics is working with municipalities, academics, private companies and communities to highlight the benefits of trees in urban environments. With Impact Lab's assistance, the company intends to develop a product to rate urban forest efficiency and develop this market in the UK with international potential.

The product will make use of satellite data to allow for more replicable, lower cost projects. It will provide a metric for urban forest managers and master planners to assess the performance of their green infrastructures and target new tree planting. Satellite data will also be used to assess tree health and features, with Impact lab helping to develop a prototype. Treeconomics is planning to bid for European Space Agency funding to develop the project further in the future.

## John Grimes Partnership

John Grimes Partnership are an innovative civil, structural, geotechnical and environmental engineering consultancy. They undertook significant work in the 1990s to enable the treatment of extensive ground problems associated with hazards of the abandoned mine workings around Gunnislake in Cornwall. They have worked on a number of prestigious and multifaceted engineering projects such as The Eden Project, Stonehenge Visitors Centre and the New Covent Garden Market.

Impact Lab's support to the company focussed on their adoption of the new British Soil sampling guidelines, and working with them to identify opportunities to streamline their current practices.

## Devon Biodiversity Centre / TVAONB

(DBRC) collects, manages and makes available records of wildlife, with a database of over 4.5 million records being updated by 2,000-5,000 records a month. DBRC also manage data on wildlife habitats and geological sites, and actively engage in partnership and community led projects to deliver field surveys and training in biological recording/species ID to a range of age groups and skill levels. DBRC is one of a national network of Local Environmental Records Centres in the UK and has been operating for over 25 years.

Impact Lab support has been focused on the collection of data around schools in the Tamar Valley, identifying schools located close to rivers/bodies of water and engaging students in green space activity. Work has also included collecting demographic data at Lower Layer Super Output Area level, mapping this data on to an Open Street map of the Tamar Valley, and collecting mapping data of footpaths, bridle ways and cycle paths.



Impact Lab supported the company during their adoption of the new British Soil sampling guidelines.

## Pollenize

Social enterprise company Pollenize are at the forefront of bee protection and sustainability within Plymouth city. Working with communities, schools and researchers, they use technology, apiary best practice and public engagement to reverse the decline of the city's pollinators. By embedding sensors in hives for remote data collection, they can better understand the health and environment of the honey bees.

Pollenize worked with Impact Lab initially to access a grant allowing them to expand the network of connected smart hives, which has now expanded into a full project for their website. Impact Lab created a custom mapping tool that allows interactive data layers for hive locations, seed shops and citizen data collection, mapping where seeds have been sown and providing clear and precise visualisation of Pollenize related activities.

The Lab analysed a database of British flowers and their pollinating species to identify which plants encouraged the largest number of pollinators, helping to create the best yielding seed packets. Impact Lab also briefly looked at the competition between the different species for the plants.



Impact Lab was able to host a test preview of the film, showing it to focus groups before The Box's grand opening in 2020.

## Soundview Media

Soundview Media is a video production company creating award-winning content for web, tv and exhibitions. Through captivating storytelling and innovative uses of technology including 360 / Virtual Reality (VR) and aerial footage, the team create experiences that highlight amazing work and projects from across the south-west. This included being commissioned by The Box to create a multi-screen immersive film showcasing Plymouth's archive footage.

Impact Lab was able to host a test preview of the film, showing it to focus groups before The Box's grand opening in 2020. Impact Lab created a virtual room where the bespoke panoramic

film could be played; recreating in the University's Immersive Vision Theatre similar conditions the installation would have within The Box. This helped Soundview realise how to best use the space within the gallery while it was still being built, and to allow audiences to view the film.

To allow Soundview Media to futureproof their VR tour technology and services, the Impact Lab created a bespoke editor toolkit with Unity3D to allow for their tours to be designed for the Oculus suite of devices. This tool will allow for rapid development of future tours and experiences, giving virtual access to tourist sites across the country.



## Pixalytics

Pixalytics Ltd develops Earth observation products, including near-real time agricultural products to determine elements such as soil moisture, land surface temperatures and evapotranspiration. They sought support to assess product efficiency within the UK, by comparing them with in-situ measurements. North Wyke Farm Platform is a key test-site for this purpose, alongside measurements from the wider COSMOS-UK sensor network.

Impact Lab partner, Rothamsted Research, provides expertise and support about their data while the University of Plymouth is providing support on the analysis and visualisation to compare the in-situ data with Pixalytics products. This allows for assessment of their Earth observation products on accuracy for systematic generation over the UK as a commercial product, together with any suggestions for further development.

We provided support on the data, analysis and visualisation to compare the in-situ data with Pixalytics products.

## SAMS/Smart Applications Management

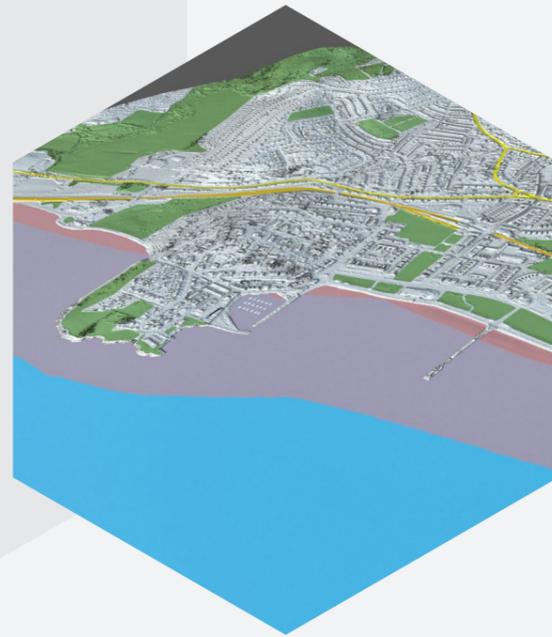
Smart Applications Management (SAM) is the UK's largest member owned provider of ITSO smart ticketing managed services. There are substantial benefits to using the convenience of smart ticketing, yet these benefits and detail on how the system works has not been clearly communicated.

Focusing on a single passenger and their data, Impact Lab will create a simplified 2D animation with the aim to communicate the complex interactions within the systems and services of SAM's ITSO Smart Ticketing in a simplified, stylized and engaging way. The animation will be used on the homepage of the SAM website and used in presentations to clients and stakeholders.

## English Riviera Geo Park

The English Riviera UNESCO Global Geopark covers the entire area of Torbay. It is defined as a site of geological significance and natural and cultural heritage. Through holistic management of protection, sustainability, accessibility and education, geoparks have become an innovative way to rejuvenate beautiful locations and attract tourism, job creation and revenue generation, supporting both social and economic development.

This project aims to create an online interactive visualisation tool, bringing together all the partner sites and tourist information in an accessible way. Including links to sustainable business, events, walks and wellbeing activities, the tool will act as a single mixed media viewer. First stage development includes an online mapping system, with the second stage development making the map three-dimensional with novel interactions.



## Elemental Digest

Elemental Digest Ltd are an innovative Agri-Food Tech company, developing and testing their new homogenous, sustainable organo-mineral fertiliser, 'Thallo®'. Their circular process converts abattoir and industrial wastes into a sterile, granular fertiliser rich in minerals, micro-nutrients and soluble carbon compound to revitalise soils and bio-fortify the food chain.

The University of Plymouth provided support by delivering a 3D animation that communicated the technology, science and benefits to a wide target audience. In addition, detailed imagery and chemical analysis of the fertiliser granules by the Plymouth Electron Microscopy Centre (PEMC) gave further insight into the structure, properties and performance of the fertiliser. The results have become important elements of their sales and marketing data to further advance their company and explain their market differentiation and IP.

## Kents Cavern

Kents Cavern is a prehistoric cave system situated in Torquay with international, educational and cultural appeal. It is a Scheduled Ancient Monument and a Site of Special Scientific Interest, notable for its rich archaeological and geological features.

The popular tourist attraction is interested in digitally preserving the cave and creating immersive experiences for visitors which can turn back time to demonstrate its history and development. Using LIDAR technology, a high precision long-range laser 3D scanner used to capture large objects, the Lab is able to recreate a digital version of part of the cave. This can then be used for accessible and immersive storytelling about the rich history of Kents Cavern and as a tool for public engagement to help support future investment and the preservation of this natural environment and its decorated heritage.



## Monkey Mind

Monkey Mind is a company with a mission to help organisations discover, understand and improve people's thoughts and feelings. Their passion is educating and empowering individuals to enjoy higher levels of mental wellbeing. They aim to facilitate effective support by using technology to ensure their resources are accessible 24/7, providing specialist resources and online coaching to organisations and individuals.

Monkey Mind worked with Impact Lab to tailor the tips sent to users of the well-being questionnaire, based on their individual results. The project involved the use of technology to identify where the responses are lowest, so that appropriate individualised tips can be retrieved from their database.

We worked with Impact Lab to tailor the tips sent to users of the well-being questionnaire, based on their individual results.

## FIGS

Famas Integrated Geoservices (FIGS) provides geological services, consulting and training involving environmental remediation, geotechnical engineering, mineral exploration, material testing, oil spill cleaning, and maritime. Looking into the environmental futures of sites in both the UK and across Africa, FIGS hopes to develop collaborative relationships, operational sectors and their use of data collection and visualisation.

Initially the support offered by Impact Lab was for brand design, including the logo, font and colour scheme. This developed into creating a prototype customisable map that shows clients, partners and areas of interest; initially focusing on mining activities within Devon but with scope to evolve.



## Universal Marine Services

The Mount Batten Ferry has been running for 22 years, 363 days a year between Mount Batten and the Barbican, carrying over 200,000 passengers a year with more than 18,500 crossings per annum. Two vessels, Copper and Sulphur, presently with diesel engines, are used in rotation.

With Impact Lab assistance a grant application was obtained to refit Copper with an Electric motor. This is being supported with expertise looking into emissions and air pollution using sensors installed on the vessels.

## Plymouth Energy Community (PEC)

PEC Trust (trading as Plymouth Energy Community or PEC) is a community energy organisation focussed on three core energy objectives; reducing energy bills, improving energy efficiency and developing local ownership of energy infrastructure. Their focus is relieving fuel poverty in the city, supporting community participation, and nurturing new projects including a community led housing development and housing retrofit service. Partner organisation, PEC Renewables, manages 5MW of renewable infrastructure.

Impact Lab support has been focussed initially on analysis of existing PEC data and data from open sources such as government bodies. The team have worked with them to identify trends and source additional data sets to aid in the identification of areas that are more likely to be brought into the analysis.

## Plymouth Science Park (PSP)

The majority of PSP's income comes from renting space to SME companies with a focus on science and technology. The company manages 11 buildings on a 25-acre site and has approximately 95 organisations on site at any one time.

Offering tenants access to buildings 24/7 poses a challenge to regulate and monitor heating across the site whilst aiming to reduce the site's carbon footprint. Data scientists from The Impact Lab have provided analytics of existing data information held about the building and temperatures across the site. This will support ongoing work to help manage heating systems more efficiently.

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## Bygg Green and Plan B International Solutions

Impact Lab have supported both Bygg Green and Plan B International Solutions with Life Cycle Assessments on product developments including bamboo carbon sequestration and recycled materials.

We worked on Life Cycle Assessments for bamboo carbon sequestration and recycled materials.

## Real World Visuals

Already known for their powerful visualisations; Real World Visuals focuses on bringing the challenges of environmental data into the realms of tangible and meaningful imagery, turning the invisible and misunderstood statistics into web tools, pictures, and animations.

They approached Impact Lab to try a new approach using game engine technology, and to be introduced to a new skillset and workflow. To support this, an existing web tool based on real-time carbon emissions was remade in 3D and used in proposals for business building and funding application.

## Beaford Arts

Beaford Arts promotes and supports the arts in rural North Devon connecting artists and communities. They work with local promoters to present high quality arts events and curate The Beaford Archive. Additionally, rural north Devon is a UNESCO World Biosphere Reserve, as a partner Beaford Arts work with communities to raise awareness of the designation and promote action through projects such as Plastic Free North Devon.

The Beaford Archive, a photographic record of people in rural North Devon, contains more than 80,000 images by James Ravilious and Roger Deakins. Impact Lab will offer support to enable these to be viewed and sought and accessed in different ways by members of the public who can then purchase the images.



## Co Cars

Co Cars operate a network of shared electric/hybrid cars throughout the South West and also pioneered Co Bikes, the UK's first on-street electric bike hire scheme. Co Cars works in partnership with local authorities, housing developers and businesses across the South West to provide smart, zero/low emission mobility-on-demand solutions for a fraction of the cost of owning or leasing. Customers can benefit from big savings on travel and parking whilst also helping reduce their carbon footprint.

Co Cars is working with Impact Lab, who will analyse the current data Co Cars has relating to customer locations/ demographics and the locations of the bike/cars and create data visualisations. Also analysed will be journey data to build a picture of usage patterns. Co Cars is planning to pilot a new type of sensor on their electric bikes to track real-time location data and other metrics. This will assist Devon County Council in planning new cycle routes and measuring the use of existing cycle routes. It will also help Co Cars analyse areas of potential growth to expand its network of electric bikes across the city to help towards a zero carbon future.

Amongst other support we are also providing help with data analytics of a newly installed Air Quality Monitoring Station.

## Cattewater Harbour Commissioners

Cattewater Harbour Commissioners exist by Act of Parliament as the navigation and conservancy authority for the Cattewater Harbour, as well as civil pilotage authority for the Port of Plymouth.

They maintain and order safe navigation for all craft using the harbour by surveying and dredging the channels, maintaining navigation marks and lights, and providing pilotage services and traffic regulation within the Cattewater.

Impact Lab is providing expertise in data analytics of a newly installed Air Quality Monitoring Station and also offering a broader skill set around maritime business management including; maritime decarbonisation, strategic repositioning of maritime assets to attract business and supply chain management, which will offer Cattewater Harbour Commissioners insights to the future of the Harbour and Port of Plymouth.

## Interchange

Interchange are facilitators of community led initiatives, such as the 'We Can Do it' Event, a community based event to showcase grass roots initiatives and promote citizenship. Interchange also are publishers of a biannual 'Zine'.

Interchange are working with Impact Lab to create a minimal viable product (MVP) to act as a learning tool for the full application of their Vacancy Atlas business idea at the next phase of the project.

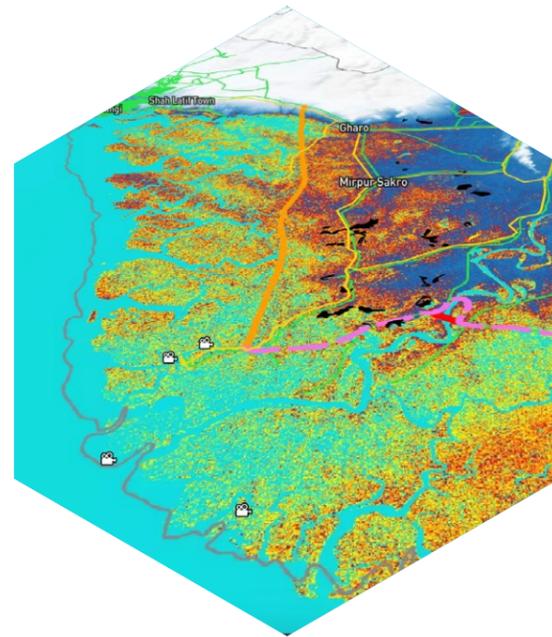
The MVP requirement is to create a platform that will connect individuals, groups and businesses looking to utilise underused urban spaces with those that either own or have access to them. Business development support is also being provided from mentors available via Impact Lab.

Connecting individuals, groups and businesses looking to utilise underused urban spaces with those that either own or have access to them.

## Resilient Coasts

Resilient Coasts Ltd has cross-sector expertise in marine, coastal and catchment environments. Reflecting the broad ecosystem services provided by their dynamic coastal systems, their work focuses on protection, power, food and livelihoods provided by these regions. They support their clients' projects by harmonising traditional engineering (mitigation) projects with nature-based solutions (adaptation) interventions. They provide advice for biodiversity net gain to support 'build back better' initiatives and carbon emission reduction working towards net zero targets.

Resilient Coasts has sought expertise from the Visualisation and Data Analytics team at Impact Lab who will undertake analytics on existing data, and incorporate open-source data into a single visual platform web-based tool. This will enable users to visualise coastal management interventions for a set geographical area, with data layers illustrated and switch controlled.



With a carbon zero goal for the mine site by 2027. Hemerdon Mine is the world's fourth largest resource of tungsten.

## Tungsten West Limited

Tungsten West Ltd acquired the world's fourth largest resource of tungsten at Hemerdon Mine, with plans to re-open the mine for full operations in 2021. With the mining industry moving towards more sustainable practices worldwide, Tungsten West has set a carbon zero goal for the mine site by 2027 and is currently reviewing internal practices and technologies that need to be implemented for power supply to be net zero.

Impact Lab will work with the company on a Life Cycle Assessment of their past and future carbon footprint, as well as looking to develop a visualisation of the site's activity. The assessment will look at past and future mining activities to evaluate which activities have the highest carbon footprint and provide advice on methods to reduce impacts.

Planning, designing, installing and maintaining corporate, commercial and residential outdoor spaces in the South West since 1973

## YGS Landscapes

YGS Landscapes (YGS) have planned, designed, installed and maintained corporate, commercial and residential outdoor spaces in the South West since 1973 including all aspects of commercial landscaping, grounds maintenance and tree care. They have been involved in many large scale projects, including three phases at Sherford new town, to the east of Plymouth, including a unique bund wall.

YGS are working with Impact Lab to analyse past data on sales, plants, prices and volumes, to assess the viability and create a pricing structure to raise funds for a local charity, through the sales of new plants/trees. Additionally, Impact Lab are assisting with air pollution monitoring for the Road to Mayflower project; the installation of trees in areas around the gateway Marsh Mills Roundabout, used by all major west-bound traffic.



## JET Engineering

JET Engineering System Solutions was founded in 2020 to develop and deploy a maritime 5G mesh communications network enabling a resilient, adaptive, and high-value connected IoT/Industry4.0 platform in littoral and open-sea environments. Integration of JET's 5G mesh networks are being developed to support multiple sectors including defence, autonomous vessels, green shipping, renewables, aquaculture, safety, and meteorological monitoring. Recently awarded multiple contracts to support Dorset Council's 5G Rural Dorset testbed, JET will deploy a range of their data capture buoys along the Jurassic coast throughout 2021.

Impact Lab have been able to offer grant funding support to increase the data collection capabilities on the deployed buoys and subsequently will provide additional data analytics support to the JET team, working alongside them to bring additional statistical analytics methods and processes into the project. Looking at data capture, storage, management and display working on real time information and possible inclusion of open source data.

## Frontier Technical

Frontier Technical is the developer of MARLIN MODULAR construction system enabling configurable floating platforms and subsea structures to be assembled underwater. The innovation will accelerate the build-out of floating offshore wind and provide 'Global Energy Access for Coastal Communities' including Small Islands Developing States (SIDS) and is based on subsea construction under controlled buoyancy conditions entirely eliminating the need for large marine construction yards and heavy lift crane vessels.

The intention is to commercialise the invention in ongoing phases by collaborating with industrial, academic, research technology and public body organisations. Aligned with elements of the UN Sustainable Development Goals and low carbon energy access for coastal communities, the technology can be applied to several sectors in the Blue Economy in isolated locations and extreme environments.

The explanation of the technology to potential stakeholders and investors is challenging and time consuming. The Visualisation team at Impact Lab are creating an animation which will communicate the complex technology both above and below the surface to explain and describe the system working.



## Mycena

MYCENA specialise in the measurement, monitoring and trend analysis of critical points on key component assets, across multi-sector industries and technologies including deployment into the utility scale renewable sector. Real-time information for a wide variety of parameters (vibration, temperature, humidity etc.) can be indicative of gradual asset degradation and a precursor to developing faults, ultimately leading to catastrophic failure. MYCENA's suite of sensors provide trend analysis, operational predictions and parameter alarms ensuring any asset falling outside of its normal operating conditions is promptly assessed so an intervention can be actioned.

Impact Lab, using their existing graphical user interface, created a client dashboard and accompanying application for field based operatives. The dashboard simplified how the data was geographically presented and interrupted and streamlined reporting facilities and notification processes. In tandem, the application provided a user friendly maintenance tool to capture intervention activities, record history logs and follow up actions.

## Scymaris Ltd

Scymaris Ltd is based at the Brixham Environmental Laboratory site located in Devon, where specialized laboratory services have been provided to the Chemical and Pharmaceutical industries for over 65 years. Scymaris provide high quality and cost effective ecotoxicology, environmental fate, plant metabolism and analytical chemistry services to the global agrochemical, pharmaceutical and chemical industries. Their goal is to develop clients' understanding of the lifecycle of chemicals in the environment and their impact on the ecosystem.

Scymaris is working with Impact Lab to develop a data tool which will provide predictive analysis on chemical breakdown across a number of environmental matrices and scenarios. The tool will enable data importing, data formatting, data manipulation as well as incorporation of available models, machine learning and other databases with the aim of predicting how a type of chemical will react under differing conditions.



## Made Snappy

Made Snappy are a Plymouth based start-up focusing on making it easier and faster to find your next home, offering skills, expertise and technologies to support viewing of properties without leaving your house. This reduces wasted visits, saving on travel expenses and the environmental impact of travelling to open-homes.

Made Snappy have approached Impact Lab to provide additional expertise and work collaboratively on new technology options for converting tours into a video format, and to investigate routes for developing simple systems that are cost effective and can be commercialised.



## Sulmara

An innovative international company worked with the University of Plymouth to advance the development of its autonomous offshore survey technology.

Sulmara Subsea, which has bases across the world, spent two weeks working out of the University's waterfront Marine Station on a series of expeditionary trials.

Specifically, this focused on tests of the company's DriX USV platform, which it believes has the potential to reduce both the time and costs involved in surveying offshore renewable energy installations, and decarbonising these operations in the process.

Technical specialists provided support to Sulmara during their trials thanks to the University's expertise within the Impact Lab project. This included providing access to a remote operation centre facility within the Marine Station to support the remote environmental survey operations, and support boats to assist with the trials and maintain safety.

The company also engaged the next generation of the marine workforce by showcasing their methodologies and technology platform to students on the BSc Ocean Exploration and MSc Hydrography courses.



## National Bee Supplies

Bees Direct (Trading as National Bee Supplies) is a Devon based company established over 40 years, manufacturing beehives and related products supporting a growing industry around bees and wildlife. They also purchase and retail complementary products through their website ([www.beekeeping.co.uk](http://www.beekeeping.co.uk)), including a range of flower seeds to attract pollinators. The business is investing in becoming carbon negative by 2024 and implementing programmes to increase biodiversity.

## Ocean City Media

Ocean City Media is moving into a new income stream around immersive content creation. Plymouth's new Full Dome at Market Hall in Devonport means for the first time there is an accessible facility for audiences in the South West and beyond to have a fully immersive experience. This creates opportunities to offer clients from a range of sectors stand-alone immersive content.

The expertise within the Impact Lab team has enabled Ocean City Media to develop a new strand of innovation using a large volume of data collected from 360 Go Pro footage and developing immersive content to communicate a large scale construction project within Plymouth. This exchange of knowledge and experience will support onward development for Ocean City Media in the use of large data sets when capturing visual recordings.



## Sport Environment

Sport Environment is a Devon based company working out of Plymouth Sound. With an electric vessel in the water and engagement with a wide audience, this business supports the shift to clean propulsion and increases engagement with people using the Mount Batten Centre for water-based and shoreline activities.

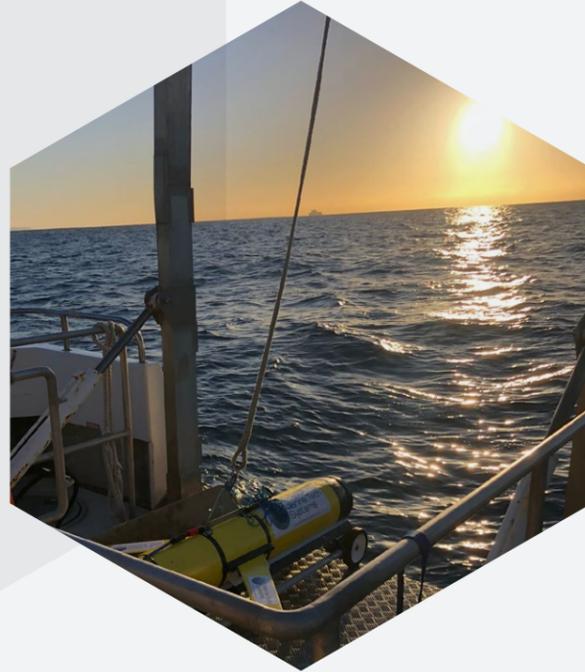
The company requires support to access and use the facilities of Smart Sound equipment with the technical skills and expertise of the Impact Lab visualisation specialism. This will offer the client an opportunity to create new content for commercial ventures and also supports wider community engagement and accessibility challenges with access to the Bounty boat itself.

## Marine Tech Services

Marine Tech Services' vision is to find ways to achieve increased efficiency and decreased costs in offshore industries. Using primarily unmanned and autonomous survey platforms and sensor technologies, they innovate existing platforms and technologies to create new and improved survey solutions. As a by-product, the company is keen to break new ground in advanced survey techniques, publishing accomplishments and working with recognised major industry primes including oil and gas majors and defence partners.

It is the ambition of MTS and Blue Ocean to achieve extensive growth in the UK Defence Sector and internationally across the wider offshore industry, in particular Oil & Gas and offshore renewables. Increasingly organisations are turning to autonomous vehicles to minimise the health and safety risk to their personnel and decrease operating costs.

Specialist technical support is provided via Impact Lab to support deployment trials of a glider-based acoustic monitoring system. This expertise from Impact Lab will assist in the planning, equipment readiness and coordination of assets in the water (e.g. transducers and gliders with arrays).



We have supported Pushed with access to research, knowledge and expertise from the University of Plymouth's Digital, Art & Design staff.

## Pushed

Pushed is a well established but expanding business. Their aim is to grow and cover the middle market animation and video production requirements for medium to large SME's and upwards. They offer the personal service of a freelancer coupled with the reliability and experience of a team, with the output quality of a large production house.

A key market for Pushed is with the development of Explainer Videos in 2D or 3D, creating a versatile and cost effective way for businesses to explain a process to their clients. These animated E-Learning videos are in demand and since COVID have really changed the game as a learning platform.

Impact Lab has supported Pushed with access to research, knowledge and expertise from the University of Plymouth's Digital, Art & Design staff. These additional skills, time and support will enable development in a new area of technique and industry leading showcase in a training aspect that isn't currently being used within the sector. The new, complex and innovative approach to visualisation will enable knowledge exchange for the company which can be harnessed for future growth opportunities.

## Ataro Places Ltd

Ataro Places has an aim to raise awareness within communities about the energy transition through data driven generative art which can inspire conversations, encourage engagement and signpost how individuals and local business can positively participate.

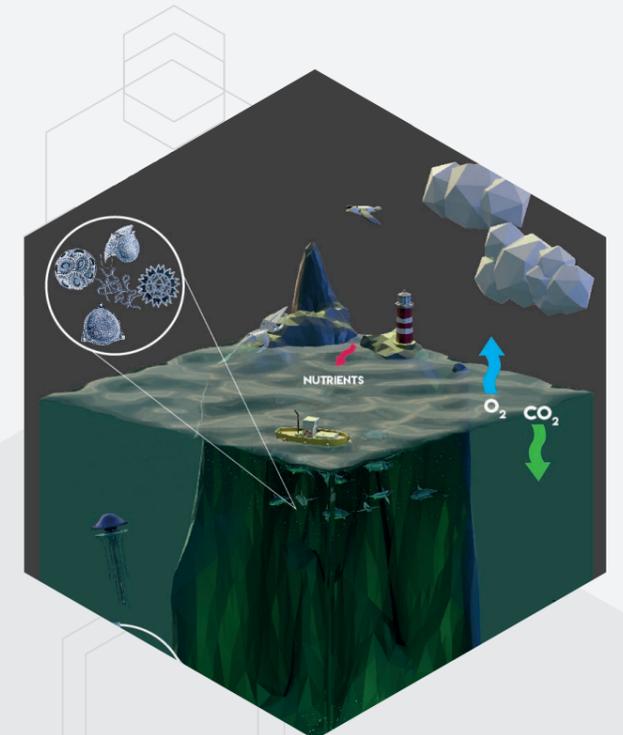
Impact Lab will provide support by assisting with the development of an application that provides a working architecture for linking the real time data (currently captured and processed by an existing Ataro Places application) with a real time engine. This work would be the foundation of an MVP tool that enables real time motion graphics and generative artwork to be developed by artists and designers.

We will provide support with the development of an application linking the real time data with a real time engine.

## Ecosystem Approaches

Ecosystem Approaches is an environmental consultancy focussing on the marine environment, with an expertise across marine conservation, marine policy, spatial analysis, time-series analysis, indicator and target development, systems thinking, science communication, translation of science to policy makers and the public, marine ecology, and marine biology. Located in Plymouth, their staff have international experience and expertise in countries such as the USA, Australia, Bahamas, Japan, Malaysia, India, South Africa, Sri Lanka, and throughout Europe.

Impact Lab supported Ecosystems Approaches with their requirement for detailed infographics to highlight the importance of plankton, these were used in visual communications for use at conferences, and teaching and engagement activities.



## Ginium

Ginium are experts in controlled growing, enabling climate and seasonally agnostic growth using indoor farming, focussing on simplifying controlled growing technologies for the user. Using science and technology, UK food growing issues are overcome while improving crop yield and quality. Ginium provide hardware for controlled growing together with software that removes the need for any specialist knowledge of indoor growing.

Ginium is working with Cornish Essential Oils and together they have accessed Impact Lab support to produce a visualisation that will demonstrate an entire growing season and product process for Lavender oil. The animation will highlight Cornish Essential Oils field planting, growth, extraction, bottling and their sustainable best practice, as well as demonstrating the benefits of Ginium's technologically driven vertical farming infrastructure model.



## Sensor Technologies Ltd

Sensor Technologies Ltd has developed and manufactured a remote monitoring tool to be used within the Marine and offshore sectors. The technology collects data via the sensor placed within large scale ropes, such as those used for mooring cargo ships or ferries. This data can be used for a multitude of purposes, including H&S Port side and on the vessels, predictive elements linked to the lifespan of the ropes, stress testing linked to weather, and ports and rope infrastructure itself. This work aligns with MEG4 (Mooring Equipment Guidelines 4th edition), the industry led governance being adopted worldwide.

The support offered via Impact Lab enabled open data sources for weather and ocean to be included alongside the sensor data sets, all analysed and displayed in a way that can be visible to the ship/port operators and feed into the decision making processes. These additional datasets are an intrinsic part of the development of MEG4.

A remote monitoring tool for Marine and offshore sectors. Collecting data from large scale ropes, used for mooring cargo ships or ferries.

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